DESCRIPTIVE SUMMARY REPORT

Suitability of Chincoteague Island for Section 404 Activities

Chincoteague Advanced Identification Study

Prepared by:

Patricia Weber

Project Manager
Wetlands and Marine Policy Section
U.S.E.P.A. Region III

T A B L E   O F   C O N T E N T S

A B S T R A C T

The Chincoteague advanced identification study was undertaken pursuant to Section 230.80 of the U.S. Environmental Protection Agency (EPA)'s 404 (b)(1) guidelines ["Advanced identification of disposal areas"] by Region III EPA and the Norfolk District Army Corps of Engineers. The purpose of the study is to provide preliminary indications of areas on Chincoteague Island, Virginia, where it is generally suitable and generally unsuitable for dredge and fill activities to be permitted via the permit process contained in Section 404 of the Clean Water Act. This information is intended for public review and consumption and will facilitate the regulatory processing of 404 permit applications as well as increase public awareness of the permit program contained in the Clean Water Act regarding the discharge of dredged or fill material into waters of the United States.

Chincoteague Island, Virginia, has many wetland areas which vary in size, shape and extent. Although historical development and wetlands filling has reduced the acreage and distribution of the island's original wetlands resources, there still remains on Chincoteague many viable wetland habitats, both palustrine and estuarine, that contribute to the island's overall environmental quality in a positive manner. The advanced identification study is based on an accurate documentation of all wetland areas on Chincoteague and an assessment of the hydrologic and ecologic functional values possessed by those wetlands.

The results of this study supplied the necessary components that went into the development of advanced decisions on the designation of areas that are both suitable and non-suitable for the future disposal of dredged or fill material. The delineation of wetland areas and the assessment of wetland functional values provided the framework for the Chincoteague advanced identification study and are described in this report.

C O N T R I B U T O R S

Gene Cocke; U.S. Army Corps of Engineers, Norfolk, Virginia
Douglas Davis, " " " " " " "
Jerry Tracy; " " " " " " "
William J. Hoffman; U.S. Environmental Protection Agency, Region III
Charles Rhodes, Jr.; " " " " " "
Karen Wolper; " " " " " "
Jane Rowan; " " " " " "
John R. Pomponio; " " " " " "
William Sipple; " " " " , Washington, D.C.
Robert Zepp; U.S. Fish and Wildlife Service, Annapolis, Maryland
Douglas Norton; Bionetics Corp., Warrenton, Virginia
William Odum; Dept. Environmental Sciences, University of Virginia

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1. Introduction

The 1977 Clean Water Act prohibits the discharge of dredged or fill material into the waters of the United States except in compliance with Section 404 of the Act (Want, 1984). Section 404 sets up the procedures for the U.S. Army Corps of Engineers, or other permitting authority, to issue permits specifying discharge sites. The approval of discharges is based on the Corps of Engineer's Public Intertest Review and the application of the U.S. Environmental Protection Agency's (EPA')'s 404(b)(1) guidelines, which are the substantive environmental criteria for dredged and fill material discharges under the Clean Water Act (45 FR 85337, Dec. 24, 1980). The guidelines define the term "waters of the United States" to include wetlands, generally swamps, marshes and bogs, and other special aquatic sites. Section 230.80 of EPA's 404(b)(1) guidelines, outline the general procedures that may be followed to conduct advanced identifications of dredged or fill material disposal sites. The purpose of advanced identification is to determine the suitability or non-suitability of an area for the future deposition of dredged or fill material. During the process all the environmental information that is normally reviewed during a Section 404 permit application is collected. To conserve resources and provide permit predictability to the public, advanced identification is carried out prior to an actual application to conduct the regulated (dredged/fill material discharge) activities. The advanced identification process and suitability determinations then follow the environmental evaluation exercises normally conducted during the proposal/permit application of an individual project. To conserve resources and provide permit predictability to the public, advanced identification is carried out prior to an actual application to conduct the regulated (dredged/fill material discharge) activities.

On Chincoteague Island, Virginia, there has been an extended period of public confusion over the regulatory process that oversees dredge and fill actions in areas that are under jurisdiction of the Clean Water Act. Often this confusion has resulted in the unauthorized filling of Chincoteague's wetlands. The longterm and cumulative impacts of widespread wetlands loss are important issues that may ultimately determine the quality of the human environment on the island. In order to reduce the public confusion and simultaneously facilitate the regulatory process, an advanced identification study was viewed as an appropriate and timely exercise to complete on Chincoteague Island.

In addition to increasing public awareness of the 404 regulatory process, the results of the Chincoteague advanced identification study will inform the public of where permits are required; specifically, of wetland and aquatic areas under jurisdiction of the Clean Water Act. Likewise, the public may become informed of the permit decisions that are likely for all areas under jurisdiction and that have been reviewed pursuant to advanced identification. By utilizing this information, potential applicants may avoid costly preconstruction planning time and investments on areas where denial of a dredge and fill permit is probable. The public should also enjoy more expeditious permit issuances since advanced identification decisions rely on previous satisfactory collections of relevant environmental information. That environmental information is the technical basis for the advanced permit decisions. This report will detail the technical information that was analyzed in support of the Chincoteague advanced identifcation study.

The Chincoteague advanced identification study established three broad goals:

Goal #1: identify and document all wetland areas that are in jurisdiction of the 404 program.

Goal #2: conduct an investigation of the hydrologic and ecologic functions of the island's wetlands and develop a baseline of relevant environmental information;

Goal #3: develop advanced determinations of Section 404 permit decisions by analysis of the results contained in Goal 1 and 2. Conduct suitablities analyses on all areas studied regarding potential impacts from dredged or fill material discharge activities and their compliance with Section 404 of the Clean Water Act.

This report will detail the procedures and results that went into the completion of each stated goal. The report is intended to describe the 404 permit program, the natural functions and values of wetland habitats, and explain in detail the results of the Chincoteague advanced identification study.

2. Environmental Setting

Geological and Physical Description

Chincoteague is located on the Atlantic side of the Delmarva Peninsula at the northern end of Virginia's Eastern Shore in Accomack County (Figure 1). It is approximately eight miles long and less than one mile wide (not including Piney Island, which is adjacent to Chincoteague). Between Chincoteague Island and the Atlantic Ocean is Assateague Island, a long coastal barrier which hosts Assateague National Seashore and Chincoteague National Wildlife Refuge.

Geologic studies indicate that Chincoteague Island is less than 2000 years old (Geottle, 1981). Such evidence suggests that Chincoteague has migrated along with Assateague over a nine mile distance landward from an origin in the Atlantic Ocean. This migration, coupled with rising sea levels that occurred during the mid- to late Holocene period may be responsible for Chincoteague's dominant physical features. Chincoteague Island exhibits a system of parallel ridges and swales that typify its coastal barrier island origin. Chincoteague is a topographically low island with an average elevation of six feet above sea level. This pattern of longitudinally arranged ridges and swales sweeps the islands length in a gentle northeast to southeast arc (Figure 2).

By being situated between the Eastern Shore mainland and the Assateague barrier, Chincoteague is afforded protection from direct ocean wind and wave energy. The aquatic environment of Chincoteague Island and its surrounding waterways has been described as a coastal low energy system (Castagna, pers. comm., 1985). This characteristic exists due to the restriction of tidal movement and transport through Tom's Cove inlet. The affect of tidal action is further depleted by dispersal over the broad and shallow Chincoteague Bay, which receives relatively minor inputs of riverine or land-based freshwater. The salt concentrations of Chincoteague Bay may, on occasion, be higher than those of normal seawater- which illustrates a low energy pattern of water circulation and tidal action (Clark, 1977). The environmental quality of Chincoteague's aquatic areas is in large part determined by the presence or absence of physical (tides and weather) influences. Due to the prevalence of a low energy physical setting, the effects of environmentally disturbing activites on aquatic ecosytems may be more pronounced than in a more dynamic, multi-influenced setting. The moderating processes of high volume tidal flushing or freshwater dilution and mixing are not dominant conditions in and around Chincoteague Island. The ability of the fairly fragile ecosystem to tolerate negative impacts (e.g., waterways dredging and wetlands filling) is difficult to predict. This is due to different portions of the ecosystem reacting differently to various types of disturbance (Clark, 1977).

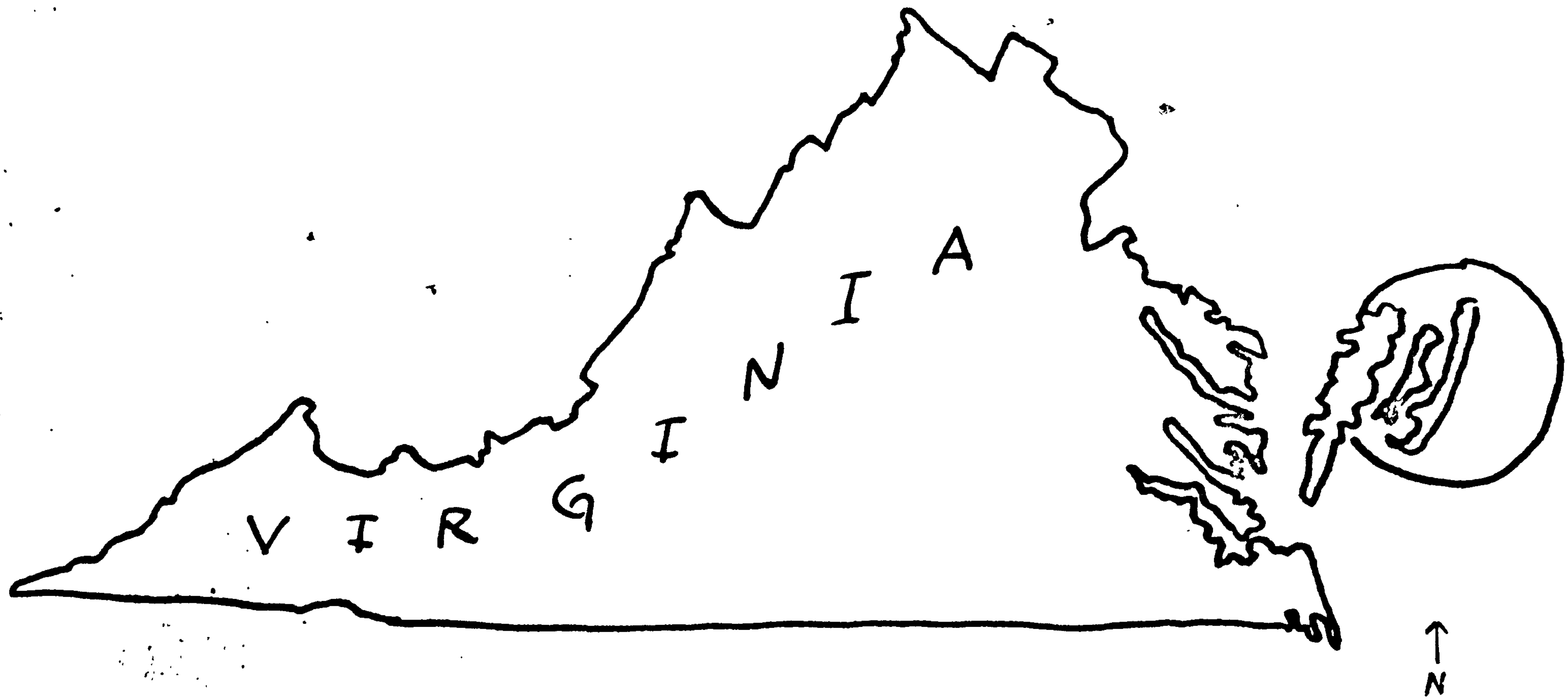


FIGURE 1. Location Map, Chincoteague Island, Virginia

An analysis of current ecosystem function and "health" can partially predict the potential tolerances of the environment to withstand stress. Wetland habitats are widely recognized for their natural values in enhancing the quality of the environment. Chincoteague's extensive wetland resources may be an important asset by their potential contributions in maintaining water quality and aquatic resources. The hydrologic and ecologic functions of Chincotegue's freshwater and saltwater wetlands is investigated at more depth later in this report.

Human Settlement and Development History

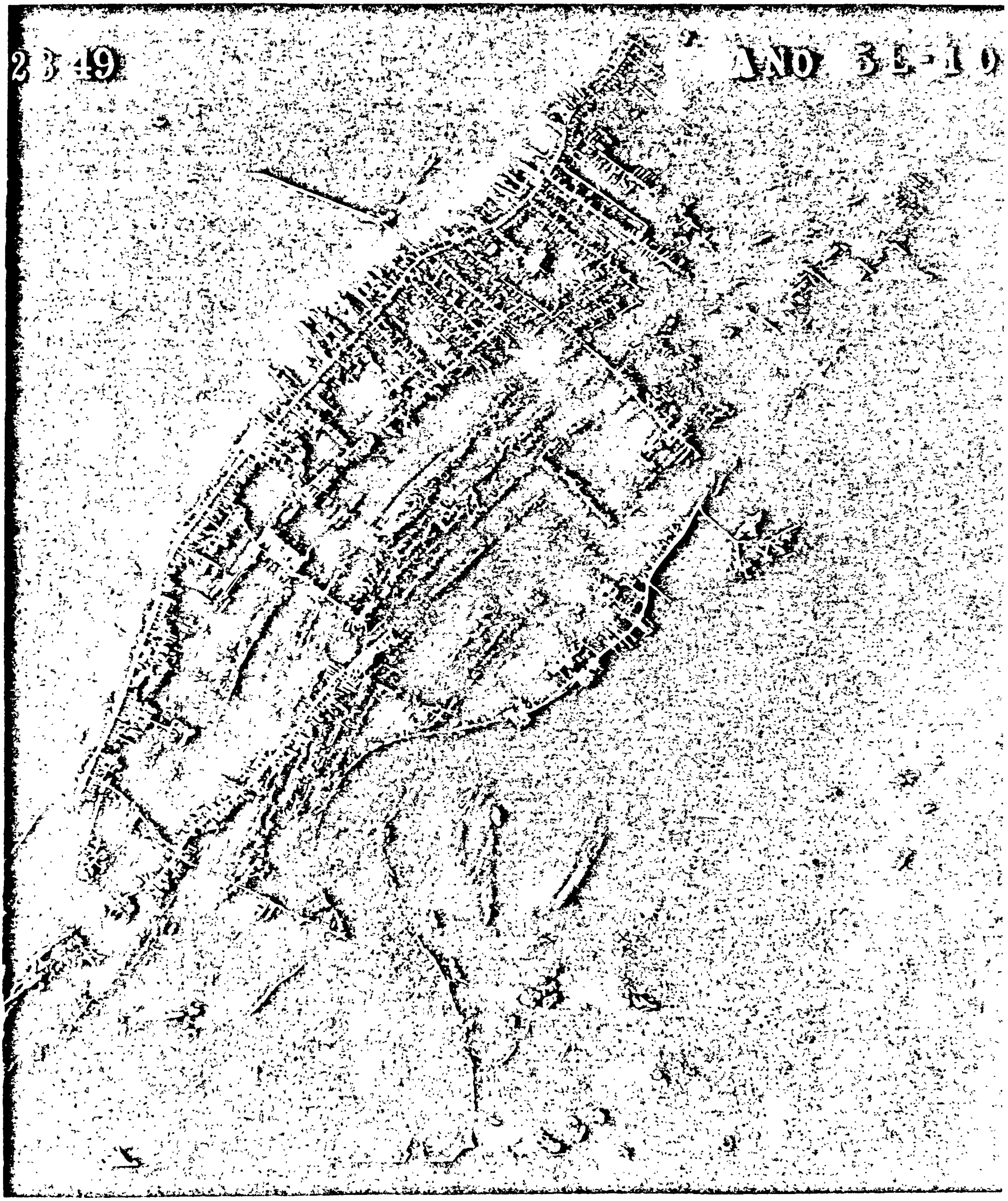
Chincoteague was settled in the early 17th century, two years after Jamestown, Virginia. Residents traditionally earned their living from fishing and aqauculture which was supplemented with agricultural (primarily poultry) operations. The causeway from the Eastern Shore mainland was built in the 1920's; however, in 1963, the bridge constructed between Assateague Island and Chincoteague had a more pronounced effect on the island's people. Since that time, the tourism trade has largely supplanted the seafood industry as the major economic activity. The proliferation of motels, campgrounds and trailer parks exists to accomodate the seasonal visitors that, in growing numbers, travel to the nearby beaches, nature trails and fishing spots. In July of each year , the annual penning and auction of ponies can attract up to 30,000 people.

Chincoteague has approximately 4500 year-round residents which can, on average, increase to 15,000 during the summer tourist season (Battiata, 1984). Local political oversight is divided on Chincoteague. Within the island are the limits of the Town of Chincoteague which is governed by a mayor and town council. The rest of the island is overseen by the County of Accomack. While there is an apparent lack of a comprehensive land use plan, the pressure to develop second homes, retirement communities and additional tourist facilities persists. The limited availability of developable upland has caused the widespread conversion of wetland habitats to uplands throughout Chincoteague Island.

Added to the scarcity of available upland is the island's problem of wastewater treatment. All of Chincoteague's residential and commercial dwellings are serviced by septic systems. The ability of septic systems to adequately treat sewage waste depends on proper installation in suitable soils at a sufficient distance from open water. Chincoteague is a low-lying island composed primarily of sand/sandy loam soils and has a naturally occurring high water table (SWCB,1975). The septic systems on Chincoteague Island are often not properly installed which can allow for inadequately treated wastes to saturate the soils and water table and ultimately, the coastal watercourses. Serious water pollution and contamination of seafood can create the potential for public health hazards. Chincoteague Island's vegetated wetlands may be treating septic system wastes through sediment retention, nutrient cycling and chemical adsorption. The need for improved sewage treatment was investigated by the town in 1975. The recommendation of that investigation was for no action to be taken due to the lack of a suitable sewage effluent discharge site. The Chincoteague advanced identification study did not include a chemical nor biological testing of the wetlands' wastewater treatment ability; that function numbers among others wetland functions in the functional assessment portion of this study.

FIGURE 2.

CHINCOTEAGUE ISLAND, 1949.



3. Characterization and Delineation of Chincoteague's Wetland Areas

The purpose of this section is to discuss the diverse character of the wetlands on Chincoteague Island and to describe the methods that were employed to map and document the wetland areas.

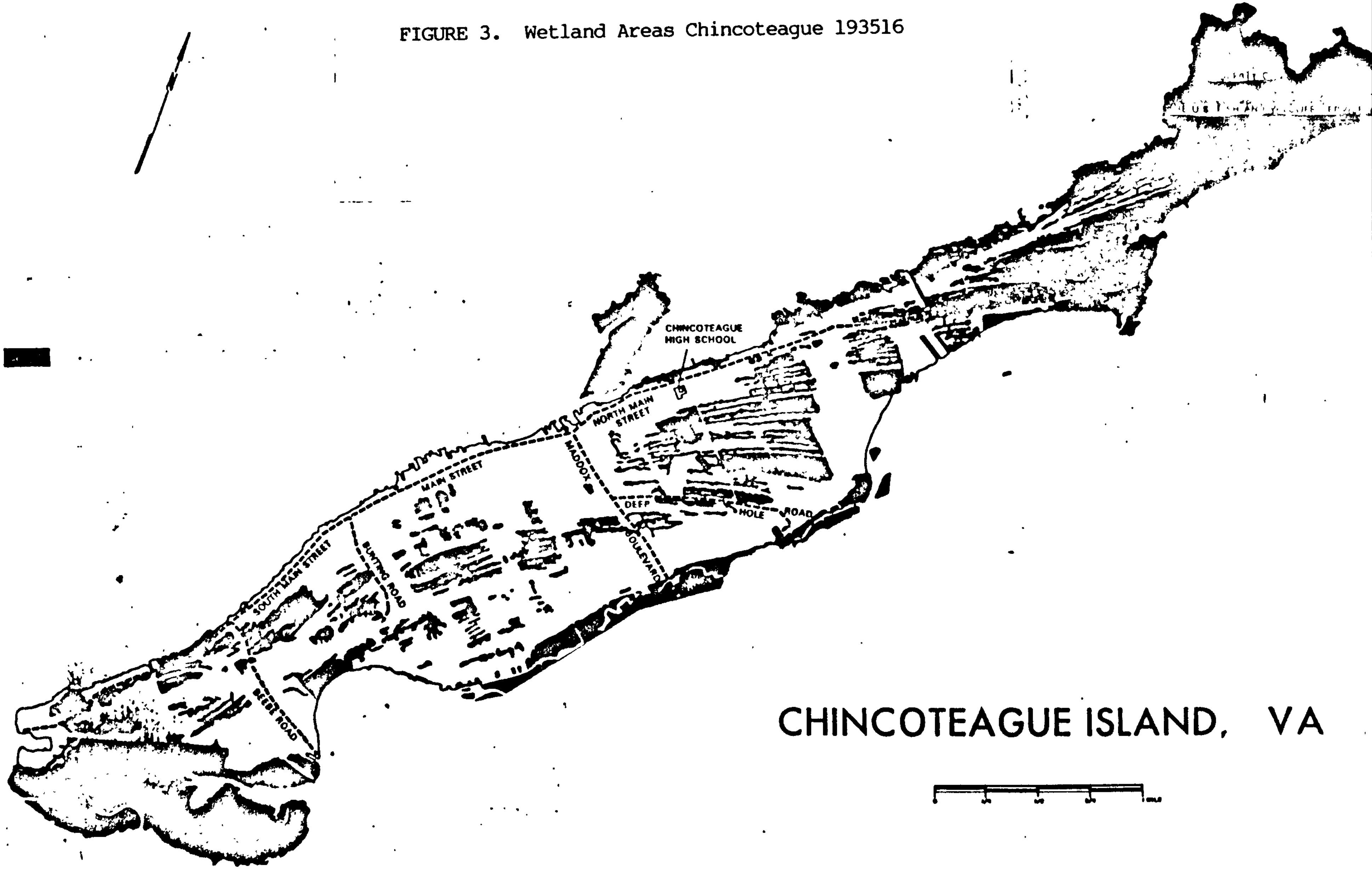
Wetland Character

Chincoteague Island possesses extensive, contiguous wetlands within and around its perimeter. The estimated total acreage of all wetland areas on Chincoteague is 1,242 acres (Figure 3). The wetlands located outside or alongside the island's border are predominantly estuarine saltmarshes. The dominant vegetation of these areas are emergent grasses [smooth cordgrass (*Spartina alterniflora*), saltmeadow hay (*S. patens*), spike grass (*Distichlis spicata*)] and upper-marsh shrubs [marsh elder (*Iva frutescens*) and groundsel tree (*Baccharis halimifolia*)]. These marshes are either regularly flooded or irregularly flooded intertidal zones that possess marsh peat, mud or sandy substrates. The ecological value of salt marshes is well documented in the scientific literature (Nixon and Oviatt, 1973; Odum, 1967; Ranwell, 1972; Clark, 1977). The functional value of Chincoteague's intertidal salt marshes and mud flats is summarized below:

- ° they generate particulate and dissolved organic matter that annually contributes to detrital based energy budgets
- ° saltmarshes and mud flats are the center of complex food webs for a variety of organisms and support numerous biological communities
- ° intertidal areas provide food and protection for young finfish and support dense populations of shellfish
- ° Chincoteague's shoreline may be afforded protection from erosion by absorption of wind and wave forces by the anchored vegetation and extensive flats
- ° saltmarshes can greatly contribute to the overall biological productivity of the bay and are constantly being utilized by migratory birds for feeding, resting, nesting and rearing of young.

The interior wetland areas on Chincoteague Island are interesting ecological areas. These wetlands are located primarily within the swales of the island's ridge/swale system. Chincoteagues ridges are geologic relicts of beach dunes and the swales maintain their own ecologic and hydrologic system. The swale wetlands are generally many times longer than wide. Some possess open water, others are fully vegetated. The system classification of the swale wetlands ranges from estuarine (saltwater) to palustrine (brackish or freshwater). The vegetation that is supported in these interior wetlands largely depends on the dominant water regimes and/or presence of tidal inlets. The swales that are further removed from

FIGURE 3. Wetland Areas Chincoteague 193516



or completely lack tidal influences are palustrine in nature and exhibit vegetation that is typically intolerant of high salt concentrations. The governing hydrologic influence on the palustrine wetland areas is predominantly through contact with the groundwater table, and also from surface runoff and unconfirmed subsurface lateral flow. Typical vegetation found in Chincoteague palustrine swales are shrubs [e.g., swamp rose (Rosa palustris), marsh hibiscus (Hibiscus mocheutos)] emergents [cattail (Typha sp), arrow-arum (Peltandra virginica), Walter's millet, (Echinochloa walterii), smartweeds (Polygonum sp.)] and some floating leaf vegetation (Lemmna sp.). Forested freshwater swamps are also found on Chincoteague. These wetlands which are dominated by red maple (Acer rubrum), sweet gum (Liquidumbar styraciflua) and other water tolerant trees, may be considered a relatively rare habitat for this coastal island.

In total, wetland types on Chincoteague Island fall within one or more of the following catagories (Cowardin, et.al., 1980):

° Regularly flooded and irregularly flooded estuarine salt marsh
° Regularly flooded intertidal sand/mud flats
° Irregularly flooded estuarine scrub-shrub wetlands
° Seasonally flooded (reed) marshes
° Semipermanently flooded freshwater marshes
° Semipermanently flooded and seasonally flooded palustrine scrub-shrub
° Temporarily flooded forested swamps

The multiple wetland types located on Chincoteague Island provide for an interesting and deverse ecosystem. Each type of wetland habitat can singularly provide important hydrologic and ecologic functions (e.g., wildlife food preferences, biochemical capibilites, productivity variations) and together the majority of the wetland areas can optimize the island's functioning as a healthy ecosystem (Adamus, 1983). This is an important condition in the broader view of environmental quality on Chincoteague. Whether the strength of the wetland ecosystem functional diversity can collectively mitigate environmental disturbances is difficult to predict. Wetland functions and values help to define environmental tolerances. The past and present disturbances (from waterway dredging, creation of upland) at the expense of wetland areas and the chronic stresses to the environment borne by human activities (domestic wastes input) may be seriously limiting the environmental tolerances on Chincoteague Island. It would be prudent for land use managers to try and define the point before which ecosystem dysfunction might become irreversible and public health and welfare are jeopardized.

Wetland Delineation

Goal #1 of the Chincoteague advanced identification study stated: "identify and document all areas that are in jurisdiction of the Clean Water Act, i.e., wetland habitats and/or waters of the United States." The delineation of wetlands on Chincoteague employed a number of technical tools and methods that produced a comprehensive map of wetlands and water habitats for the entire island.

The first technical tool used was recent aeridl photography that sufficiently displayed the land area of the entire island. This aerial photography was then interpreted by an aerial imagerist who produced overlays to the photographs that depicted different land types. The photographic interpretation methods described below are exerpted from "Wetland Identification and Assessment: Chincoteague Island, Virginia" by Douglas J. Norton of the Bionetics Corporation in Warrenton, Virginia (Norton, 1985):

Photographic Interpretation

The analysis was performed by steroscopically viewing pairs of transparencies, backlit on a standard Richards light table. By observing the site three-dimensionally, and at various magnifications, the analyst could search for objects, features, or "signatures" associated with different environmental conditions. The term "signature" refers to a combination of characteristics (such as color, tone, shadow, texture and size) which indicate a specific object or conditions, even though the object itself is not identifiable from the photography.

In order to identify plant community types, land use, and wetland/upland boundaries, several sets of aerial photographic coverage were consulted. All or part of the study area was included in photography representing the spring, summer, and fall seasons in medium to large scale using color or color infrared film.

Color infrared photography dated April 1982 (scale 1:24,000) was selected as the most suitable photographic base for feature delineation, and 20"x24" prints at 1:6,000 scale were prepared. The large size and scale of the prints mad it easy to delineate small plant communities on the acetate overlays, since at this scale a square inch equaled about 2 hectares (5 acres).

Field Verification

The overlays depicting photo-interpreted wetland areas were subjected to intensive verification in the field. All wetland habitats were verified in concert with three basic tasks:

a) confirmation of the wetland/upland boundary on aerial overlays,
b) adjusting and updating the interpretation, showing any additions or losses since the date of photography,
c) providing final land cover determinations on zones not identified by photographic interpretation.

Ground-truthing of the Chincoteague wetlands identification included observations of hydrologic conduits in the form of pipes, culverts, and drainage ditches.

For the most part, the photo-interpretation products acted as a field guide to conduct wetland identification methods much like those that are conducted during the individual permit application process. The technical standards for delineating wetlands under Section 404 of the Clean Water Act are to observe and identify three parameters indicating the presence of a wetland. These three parameteters are: wetlands hydrology (inundation, surface saturation, silt deposition, water marks), wetland soils (presence or absence of mottling, saturation), and wetlands vegetation (presence of obligate hydrophytes and/or facultative plant species). These characteristics were observed during the wetland delineation portion of the project.

4. Wetlands Functional Assessment

Goal #2 of the Chincoteague advanced identifcation study was to "conduct an investigation on the hydrologic and ecologic functions of the island's wetlands and develop a baseline of relevant environmental information." This goal logically follows the characterization and delineation of wetland areas (Goal #1) and completes the collection of environmental information necessary for permit processing. In the special case of advanced identification, however, that information is gathered prior to a permit application.

The purpose of conducting a wetland functional assessment on Chincoteague Island is to identify the observable environmental processes of the island's wetlands resources and survey the degree of function of those processes. This analysis furnishes useful information on the various properties of the wetland areas and helps define their contribution to the environment. The ability of both freshwater and saltwater wetlands to provide valuable environmental functions is well documented in the literature (Greeson, et. al., 1979; Darnell, 1976; Good, et.al., 1978). Most of the values commonly attributed to wetlands have been the focus of scientific studies that have confirmed, through intricate or long-term analyses, the ability of wetland ecosystems to perform certain natural functions. By recognizing the scientific community's documentation of wetland functional values, the wetlands assessment on Chincoteague was well guided. The general functional groups of environmental functions and values can be broadly catagorized as below:

Ecological Determinants:	Hydrologic Determinants:
wildlife habitat support	flood water storage
fisheries habitat support	storm flow modification
food web structure support	groundwater (aquifer) recharge
biotic community habitattion	shoreline erosion abatement
endangered species habitat	trapping, cycling of sediments and nutrients

Other widely recognized environmental functions of wetlands include: recreation, bird-watching, fishing, boating, education, research, and food, fiber and fuel production.

Table 1.

1. CONTIGUITY
2. CONSTRICTION
3. SHAPE OF BASIN
4. FETCH AND EXPOSURE
5. BASIN SURFACE
6. WETLAND SURFACE AREA
7. BASIN AREA/WATERSHED AREA RATIO
8. BASIN AREA/SUBWATERSHED AREA RATIO
9. LOCATION IN WATERSHED
10. STREAM ORDER
11. GRADIENT OF SUBWATERSHED
12. GRADIENT OF TRIBUTARIES
13. GRADIENT OF BASIN
14. PERCHED CONDITION
15. LAND COVER OF SUBWATERSHED
16. LAND COVER TRENDS
17. SOILS OF SUBWATERSHED.
18. LITHOLOGIC DIVERSITY
19. DELTA ENVIRONMENT
20. EVAPORATION-PRECIPITATION BALANCE
21. WETLAND SYSTEM
22. VEGETATION FORM
23. SUBSTRATE TYPE
24. SALINITY AND CONDUCTIVITY
25. pH
26. HYDROPERIOD
27. FLOODING DURATION AND EXTENT
28. ARTIFICIAL WATER LEVEL FLUCTUATIONS
29. NATURAL WATER LEVEL FLUCTUATIONS
30. TIDAL RANGE
31. SCOURING
32. FLOW VELOCITY
33. WATER DEPTH (MAXIMUM)
34. WATER DEPTH (MINIMUM)
35. WIDTH
36. OXYGENATION OF SEDIMENTS
37. MORPHOLOGY OF WETLAND
38. FLOW BLOCKAGE
39. BASIN ALTERATIONS
40. POOL-RIFFLE RATIO
41. BASIN'S VEGETATION DENSITY
42. WETLAND'S VEGETATION DENSITY
43. SHEET VS. CHANNEL FLOW
44. WETLAND-WATER EDGE
45. GRADIENT OF EDGE
46. SHORELINE VEGETATION DENSITY
47. SHORELINE SOILS
48. DISTURBANCE
49. PLANTS: FORM RICHNESS
50. PLANTS: WATERFOWL VALUE
51. PLANTS: ANCHORING VALUE
52. PLANTS: PRODUCTIVITY
53. INVERTEBRATE DENSITY: FRESHWATER
54. INVERTEBRATE DENSITY: TIDAL FLAT
55. SHORE EROSION MEASUREMENTS
56. GROUND WATER MEASUREMENTS
57. SUSPENDED SOLIDS
58. ALKALINITY
59. EUTROPHIC CONDITION
60. WATER QUALITY CORRELATES
61. WATER QUALITY ANOMALIES
62. WATER TEMPERATURE ANOMALIES
63. BOTTOM WATER TEMPERATURE
64. DISSOLVED OXYGEN
65. UNDERLYING STRATA
66. DISCHARGE DIFFERENTIAL
67. TSS DIFFERENTIAL
68. NUTRIENT DIFFERENTIAL
69. RECHARGE EFFECTIVENESS
70. DISCHARGE EFFECTIVENESS
71. FLOOD STORAGE EFFECTIVENESS
72. SHORELINE ANCHORING OPPORTUNITY
73. SHORELINE ANCHORING EFFECTIVENESS
74. SEDIMENT TRAPPING OPPORTUNITY
75. SEDIMENT TRAPPING EFFECTIVENESS

Observed Properties In the Assessment of Wetland Functional Functions.

The assessment of hydrologic and ecologic functions on the wetland habitats of Chincoteague Island was limited by time and funding. Representative wetland areas (Figure 4) were selected and surveyed in a fashion that was both reliable and rapid. The U.S. Fish and Wildlife Service was retained by EPA Region III to conduct the wetlands functional assessment on Chincoteague Island. The collection of technical information was obtained through the Department of Environmental Sciences at the University of Virginia. A supplementary investigation was conducted jointly by the Norfolk Corps of Engineers, the Fish and Wildlife Service - Annapolis, and Region III EPA. Two descriptive reports were completed that discuss the wetlands assessment on Chincoteague Island (Odum, et.al., 1986; EPA Region III unpubl.rep.). The pertinent findings of that literature is discussed in this section.

Methods

The assessment of wetland functions and values on Chincoteague was conducted using the methodology developed by Adamus and Stockwell; "A Method for Wetland Functional Assessment " (2 vols., FHWA-IP-82-24, March, 1983). The method provides a rapid procedure to indicate the functional values of selected wetland study sites on Chincoteague by primarily employing field observations. The method entails the recording of over 400 observations that supply qualitative information on the following functions:

- groundwater recharge and discharge
- flood storage and desynchronization
- nutrient retention and removal
- sediment trapping
- shoreline anchoring, erosion control
- food web support
- fishery habitat
- wildlife habitat
- recreational use

This inventory includes questions on the wetland study site, its waterways, and the adjacent land areas. The observations are presented and explained in terms of their ability to predict wetland functions (Table 1). The recorded observations then form the basis of interpreting the presence and degree of wetland functions (above). The use of wetland technical expertise also supplimented the Chincoteague wetland assessment, in an effort to supply as much information on the wetland areas as time and funding could afford. Areas for possible future scientific analyses (water quality studies, detrital export studies) were noted throughout the process.

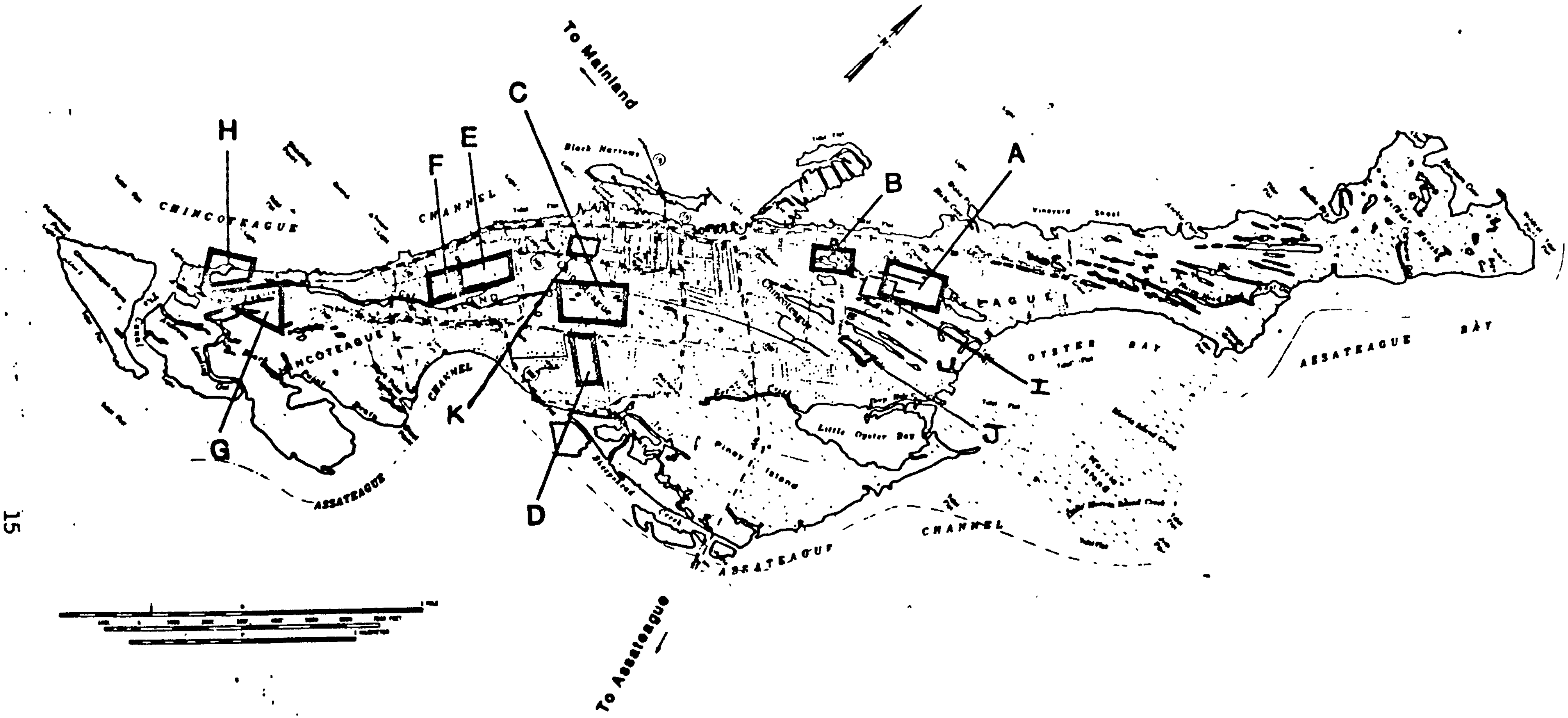


FIGURE 4. Wetland Functional Value Study Sites

The results of the wetlands functional assessment were tabulated for each of the wetland areas studied (Table 2). The various wetland study areas were selected as suitably representing all classes and systems of habitats for the island. From the compiled results, the wetland areas on Chincoteague appear to share the ability to support a number of important environmental functions. These are: groundwater recharge, flood storage, sediment trapping and nutrient retention, and wildlife habitat. The ability of the wetlands on Chincoteague Island to perform these functions may be due to the presence of a number of physical and biological properties. For instance, the groundwater recharge function can be explained by the existence of a high groundwater table directly underneath the island's surface and by the prevalence of wetland areas in direct contact with the underground water source. The important environmental factors of the groundwater recharge function are replenishment of the aquifer, desynchronization of flood peaks, and water turbidity reduction.

The role of Chincoteague's wetlands to retain or recycle nutrients is significant from the standpoint of both environmental quality and public health and welfare. Given that the functional survey conducted on the island did not entail the collection of empirical data, the high functional ratings indicate a strong potential for the wetlands to partially treat sewage wastes. Vegetation that is suited for wetland habitats can uptake nutrients (nitrogen and phosphorus) from the water and sediments and store or recycle them. This action by wetlands prevents the direct discharge of polluted water into open channels and bays. Nutrient retention and removal is a limited function when waste input exceeds a wetlands' chemical and physical capabilities. The increases in waste production during the summer season on Chincoteague can cause oxygen deficiencies in the wetlands and waterways. More important is the migration of untreated wastes to the coastal waters where contamination of sea life (fish and shellfish) can occur. The cumulative losses of wetlands (and their positive contributions to water quality) on Chincoteague is an important factor when impacts of future discharges of dredged or fill material are considered.

Wildlife, mostly in the form of migratory birds, visit Chincoteague Island and the surrounding waterways in very large numbers all year. The maintenance of a national wildlife refuge on Assateague further illustrates this regions popularity as a feeding and nesting area by birds. On Chincoteague Island, dense concentrations of seasonal wading birds were observed in the islands interior wetland habitats throughout the advanced idientification study. The herons, egrets and ibises appeared to enjoy the shelter and solitude of the interior swales equal to the the salt-

Table 2. Observed Functional Values Matrix

FUNCTIONAL SIGNIFICANCE SUMMARIES
Chincoteague Wetlands - Functional Values Assessment

Possible Ratings: very low - low - moderate - high - very high

Function/Site

	A	B	C	D	E				F		G	H	I		J	K	
	Oyster Point Devel.	Pine Ridge Swales	Behind High School	Deep Hole Road	Willow Street Wooded Swales N	E	W	SW	Fowling Gut System I	II	Hard-woods Swamp	Mire Pond Fill	Mire Pond Shrub-Scrub I	II	Ocean Breeze South	Chinc. Channel Marsh	High Ratin Functional Totals
G R*	HIGH	HIGH	MOD	HIGH	HIGH	MOD	HIGH	HIGH	LOW	HIGH	HIGH	LOW	LOW	HIGH	LOW	LOW	9/16*
G D*	MOD	HIGH	HIGH	LOW	HIGH	MOD	MOD	LOW	LOW	HIGH	LOW	LOW	LOW	LOW	HIGH	HIGH	6/16
F S*	HIGH	HIGH	HIGH	V.HIGH	HIGH	HIGH	HIGH	HIGH	HIGH	V. HIGH	V. HI	HIGH	HIGH	V. HI	HIGH	HIGH	16/16*
S A	MOD	MOD	MOD	HIGH	V LO	LOW	LOW	LOW	MOD	HIGH	MOD	MOD	MOD	MOD	V. HI	HIGH	4/16
S T*	HIGH	MOD	HIGH	LOW	MOD	MOD	MOD	HIGH	V. HIGH	V. HIGH	HIGH	V. HI	V. HI	V. HI	V. HI	V. HIGH	11/16*
N R*	HIGH	V. HI	V. HI	HIGH	HIGH	HIGH	HIGH	HIGH	V. HIGH	HIGH	V. HI	V. HI	V. HI	V. HI	V. HI	HIGH	16/16*
F C	LOW	MOD	MOD	HIGH	MOD	MOD	MOD	MOD	MOD	MOD	MOD	MOD	MOD	MOD	MOD	HIGH	2/16
F H	V. LOW	LOW	MOD	LOW	V LO	V LO	V LO	V LO	MOD	V. LOW	V. LOW	MOD	MOD	LOW	MOD	HIGH	1/16
W H*	LOW	V. HI	HIGH	HIGH	V LO	LOW	LOW	MOD	HIGH	MOD	MOD	MOD	HIGH	MOD	HIGH	HIGH	7/16*
A R	V. LOW	LOW	LOW	LOW	V LO	LOW	LOW	V LO	LOW	LOW	V. LOW	LOW	MOD	LOW	LOW	HIGH	1/16
P R	LOW	HIGH	MOD	LOW	MOD	LOW	MOD	MOD	MOD	HIGH	MOD	MOD	MOD	MOD	MOD	MOD	2/16

KEY:
GR = Groundwater recharge
GD = Groundwater discharge
FS = Flood storage and desynchronization
SA = Shoreline anchoring
ST = Sediment trapping
NR = Nutrient retention
FC = Food chain support
FH = Fishery habitat
WH = Wildlife habitat
AR = Active recreation
PR = Passive Recreation

marshes. By being observed in such large numbers, it was deduced that the wildlife obtained suitable food in the palustrine swales. Habitation by birds in these wetlands can provide for mutual benefits (e.g., insect control) and proof of a wetland's value. The recreational value of bird-watching is also supported by many wetland areas on Chincoteague Island.

The assessment of wetlands functions and values is an important component in the advanced identification process. The final determinations of areas both suitable and unsuitable for the future disposal of dredged or fill material relies heavily on the existing ecologic and hydrologic condition of wetlands on Chincoteague Island. In addition, by having environmental information collected over most of the island's area, the integration of other information sources (demography, climate) is facilitated. That integration forms the basis of the advanced permit designations which is the subject of the next section.

5) Wetland Suitability Determinations for Section 404 Activities

Section 404 of the Clean Water Act sets up the procedure for issuing permits that specify sites for the discharge of dredged or fill material. Advanced identification of disposal areas allows for the identification of sites to be considered as 1) possible future disposal sites, or 2) areas generally unsuitable for disposal site specification (45 FR 85357, Wed., Dec. 24, 1980). Either type of identification constitutes information to facilitate permit application and processing. The advanced identification of areas for future dredged and/or fill material discharges is required to be carried out with a full consideration of EPA's 404(b)(1) guidelines. The designation of a site as a possible future disposal site must, therefore, be based on the consideration that the future use is in compliance with the regulations. Areas designated as generally unsuitable for dredged or fill material discharges are so designated because such a use of that area is likely not considered to be in compliance with the regulations. Both considerations must take into account all the relative criteria that normally form the basis of Section 404 permit decisions.

The Chincoteague advanced identification study developed the necessary decisionmaking criteria through Goal #1: the mapping of jurisdictional areas where advanced permit decisions could be applied; and Goal #2: collection of environmental information. Goal #3 called for the development of "advanced determinations of Section 404 permit decisions by analysis of the results contained in Goal 1 and 2" and to "conduct suitability analyses on all areas studied by considering potential impacts from dredged or fill material discharge activities and their compliance with Section 404 of the Clean Water Act."

The regulatory agencies and permitting authorities discussed at length the environmental data that had been collected prior to the designation of advanced permit decisions for Chincoteague Island. Upon review of that information, a range of regulatory decisionmaking was developed that would illustrate the probable decision for particular parcels of wetland areas. The wetland habitats that exhibited the highest degrees of functional value were jointly viewed as areas where the discharge of dredged or fill material would not likely be approved. Wetlands that possessed important environmental functions yet were segregated from larger more connected systems were viewed as generally unsuitable for dredge and fill activities from the standpoint of significant environmental degradation that would be caused by the loss of the habitat. Other factors considered in the designation of areas generally unsuitable for the disposal of dredged or fill material were the availability of alternative sites, and whether the discharge of fill would support a water dependent activity.

The designation of areas generally suitable for the future disposal of dredged or fill material was based on the considertions of lesser functional values expressed by these areas and that the loss by filling of these habitats would not constitute significant degradation to the environmental quality of Chincoteague Island. Compliance with the regulations would be required, however, prior to the issuance of permits in those areas.

Since advanced identification of disposal areas is intended as a public advisory, individuals may still apply for Section 404 permits for any area that is under jurisdiction of the Clean Water Act. , Advanced identification is a service to the public in that it will shorten the permit processing time due to the collection of sufficient environmental data. Applicants will now know before hand of areas where permit issuance or denial is probable. Applicants and the public alike will be informed of the predictable outcomes regarding dredge and fill activities on Chincoteague Island. In addition, regulatory enforcement for activities not in compliance with the Clean Water Act should be reduced. Public awareness of the Section 404 permit program is considered a key benefit to advanced identification studies. It also accomplishes public relief from regulatory burdens by expressing openly the federal agencies decision making processes.

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